

WHAT IS CLAIMED IS:

- Sub A17*
1. A surgical instrument for use with an electro-mechanical surgical device, comprising:
 - a coupling configured to couple the surgical instrument with the electro-mechanical surgical device; and
 - a memory unit configured to store data representing at least one parameter relating to the surgical instrument;
 - wherein the coupling includes a data connector configured to connect the memory unit with the electro-mechanical surgical device.
 2. The surgical instrument according to claim 1, further comprising at least one rotatable drive shaft configured to couple with a respective drive shaft of the electro-mechanical surgical device.
 3. The surgical instrument according to claim 1, further comprising a first rotatable drive shaft and a second rotatable drive shaft, each of the drive shafts being configured to couple with a respective drive shaft of the electro-mechanical surgical device.
 4. The surgical instrument according to claim 1, wherein the first data is readable by a control system of the electro-mechanical surgical device.

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 5. The surgical instrument according to claim 1, wherein the data connector is configured to electrically and logically connect the memory unit to a control system of the electro-mechanical surgical device.

6. The surgical instrument according to claim 1, wherein the coupling is configured to detachably attach the surgical instrument to the electro-mechanical surgical device.

7. The surgical instrument according to claim 1, wherein the surgical instrument includes a surgical stapler/cutter instrument.

8. The surgical instrument according to claim 7, wherein the surgical stapler/cutter instrument includes an anvil portion and a staple driver/cutter portion.

9. The surgical instrument according to claim 8, further comprising a first rotatable drive shaft configured to open and close the anvil portion and a second rotatable drive shaft configured to drive the staple driver/cutter portion.

10. The surgical instrument according to claim 1, wherein the at least one parameter includes at least one of a usage data, a serial number data and a type of the surgical instrument.

11. The surgical instrument according to claim 1, further comprising:
a least one driven element; and
a gear arrangement configured to couple a drive shaft of the electro-mechanical surgical device to the at least one driven element, the gear arrangement being configured to convert a high-speed rotation of the drive shaft to drive the at least one driven element at a high-torque.

12. A surgical instrument for use with an electro-mechanical surgical device, comprising:

a coupling configured to couple the surgical instrument with the electro-mechanical surgical device; and

a memory unit configured to store data representing a usage of the surgical instrument;

wherein the coupling includes a data connector configured to connect the memory unit with the electro-mechanical surgical device.

13. The surgical instrument according to claim 12, further comprising at least one rotatable drive shaft configured to couple with a respective drive shaft of the electro-mechanical surgical device.

14. The surgical instrument according to claim 12, further comprising a first rotatable drive shaft and a second rotatable drive shaft, each of the drive shafts being configured to couple with a respective drive shaft of the electro-mechanical surgical device.

15. The surgical instrument according to claim 12, wherein the first data is readable by a control system of the electro-mechanical surgical device.

16. The surgical instrument according to claim 15, wherein the control system is configured to limit usage of the surgical instrument in accordance with the usage data.

17. The surgical instrument according to claim 12, wherein the data connector is configured to electrically and logically connect the memory unit to a control system of the electro-mechanical surgical device.

18. The surgical instrument according to claim 12, wherein the coupling is configured to detachably attach the surgical instrument to the electro-mechanical surgical device.

19. The surgical instrument according to claim 12, wherein the surgical instrument includes a surgical stapler/cutter instrument.

20. The surgical instrument according to claim 19, wherein the surgical stapler/cutter instrument includes an anvil portion and a staple driver/cutter portion.

21. The surgical instrument according to claim 20, further comprising a first rotatable drive shaft configured to open and close the anvil portion and a second rotatable drive shaft configured to drive the staple driver/cutter portion.

22. The surgical instrument according to claim 12, further comprising:
a least one driven element; and
a gear arrangement configured to couple a drive shaft of the electro-mechanical surgical device to the at least one driven element, the gear arrangement being configured to convert a high-speed rotation of the drive shaft to drive the at least one driven element at a high-torque.

23. A surgical instrument for use with an electro-mechanical surgical device, comprising:

a coupling configured to couple the surgical instrument with the electro-mechanical surgical device; and

a memory unit configured to store data representing a serial number of the surgical instrument;

wherein the coupling includes a data connector configured to connect the memory unit with the electro-mechanical surgical device.

Same as 1 24. The surgical instrument according to claim 23, further comprising at least one rotatable drive shaft configured to couple with a respective drive shaft of the electro-mechanical surgical device.

Same as 3 25. The surgical instrument according to claim 23, further comprising a first rotatable drive shaft and a second rotatable drive shaft, each of the drive shafts being configured to couple with a respective drive shaft of the electro-mechanical surgical device.

Same as 4 26. The surgical instrument according to claim 23, wherein the first data is readable by a control system of the electro-mechanical surgical device.

Same as 5 27. The surgical instrument according to claim 23, wherein the data connector is configured to electrically and logically connect the memory unit to a control system of the electro-mechanical surgical device.

28. The surgical instrument according to claim 23, wherein the coupling is configured to detachably attach the surgical instrument to the electro-mechanical surgical device.

29. The surgical instrument according to claim 23, wherein the surgical instrument includes a surgical stapler/cutter instrument.

30. The surgical instrument according to claim 29, wherein the surgical stapler/cutter instrument includes an anvil portion and a staple driver/cutter portion.

31. The surgical instrument according to claim 30, further comprising a first rotatable drive shaft configured to open and close the anvil portion and a second rotatable drive shaft configured to drive the staple driver/cutter portion.

32. The surgical instrument according to claim 23, further comprising:
a least one driven element; and
a gear arrangement configured to couple a drive shaft of the electro-mechanical surgical device to the at least one driven element, the gear arrangement being configured to convert a high-speed rotation of the drive shaft to drive the at least one driven element at a high-torque.

33. An electro-mechanical surgical device, comprising:
at least one rotatable drive shaft;
a motor arrangement configured to rotate the at least one rotatable drive shaft
from a proximal end thereof;

a first gear arrangement disposed at a distal end of the rotatable drive shaft; and

at least one element driven by the gear arrangement;

wherein the gear arrangement is configured to convert a high-speed rotation of the rotatable drive shaft to drive the at least one driven element at a high-torque.

34. The electro-mechanical surgical device according to claim 33, further comprising a surgical attachment attachable to the distal end of the rotatable drive shaft, the surgical attachment including the at least one element.

35. The electro-mechanical surgical device according to claim 34, wherein the first gear arrangement is disposed in the surgical attachment.

36. The electro-mechanical surgical device according to claim 34, wherein the surgical attachment includes a circular surgical stapler attachment.

37. The electro-mechanical surgical device according to claim 36, wherein the at least one element includes at least one of an anvil of the circular surgical stapler attachment and a staple driver/cutter of the circular surgical stapler attachment.

38. The electro-mechanical surgical device according to claim 33, wherein the at least one rotatable drive shaft includes a first rotatable drive shaft and a second rotatable drive shaft, the at least one element including a first element driven by the first rotatable drive shaft and a second element driven by the second rotatable drive shaft, the gear arrangement including a first gear system configured

to convert a high-speed rotation of the first rotatable drive shaft to drive the first driven element at a high-torque and a second gear system configured to convert a high-speed rotation of the second rotatable drive shaft to drive the second driven element at a high-torque.

39. The electro-mechanical surgical device according to claim 38, wherein the motor arrangement includes a first motor configured to rotate the first rotatable drive shaft and a second motor configured to rotate the second rotatable drive shaft.

40. The electro-mechanical surgical device according to claim 38, further comprising a surgical attachment detachably attachable to the distal end of the first and second rotatable drive shafts, the surgical attachment including the first and second elements.

41. The electro-mechanical surgical device according to claim 40, wherein the first element includes an anvil and the second element includes a staple driver/cutter.

42. The electro-mechanical surgical device according to claim 33, further comprising a second gear arrangement disposed between the motor arrangement and the at least one rotatable drive shaft, the second gear arrangement configured to convert a high torque transmitted by the motor arrangement to rotate the at least one rotatable drive shaft at the high speed.

43. The electro-mechanical surgical device according to claim 33, wherein the first gear arrangement includes at least one of a spur gear arrangement, a

planetary gear arrangement, a harmonic gear arrangement, cycloidal drive arrangement and an epicyclic gear arrangement.

44. The electro-mechanical surgical device according to claim 33, wherein each of the first gear arrangement and the second gear arrangement includes at least one of a spur gear arrangement, a planetary gear arrangement, a harmonic gear arrangement, cycloidal drive arrangement and an epicyclic gear arrangement.